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## PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional)

020244

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Application Number

10/083,533

Filed

February 27, 2002

First Named Inventor

Hiroshi HASHIMOTO

Art Unit

2814

Examiner

Thao X. Le

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).

Note: No more than five (5) pages may be provided.

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest.  
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed.  
(Form PTO/SB/96)

☒ attorney or agent of record.  
Registration number 56,171

☐ attorney or agent acting under 37 CFR 1.34.

Registration number if acting under 37 CFR 1.34 \_\_\_\_\_

  
Signature

Michael J. Caridi

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Telephone number

July 6, 2006

Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below\*.

☐ \*Total of \_\_\_\_\_ forms are submitted.

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re the Application of: **Hiroshi HASHIMOTO et al.**

Group Art Unit: **2814**

Serial No.: **10/083,533**

Examiner: **Thao X. Le**

Filed: **February 27, 2002**

Confirmation No.: **6400**

For: **SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE  
INCLUDING A SEMICINDUCTOR DEVICE HAVING A  
STABLE THRESHOLD CHARACTERISTIC**

Attorney Docket Number: **020244**

Customer Number: **38834**

**PRE-APPEAL BRIEF REQUEST FOR REVIEW**

Mail Stop: AF

Commissioner for Patents

P. O. Box 1450

Alexandria, VA 22313-1450

Date: **July 6, 2006**

Sir:

This Request is filed concurrent with a Notice of Appeal in compliance with 37 C.F.R. §41.31. Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

**REMARKS**

Claims 1-4, 6-10 and 12 and 40 are currently pending.

Claims 1-4, 7, 9-10, 12, 14 and 40 stand rejected under 35 U.S.C. 103 as being unpatentable over US 6544845 to **Yoo et al.** (hereinafter "Yoo") in view of US 6294430 to **Fastow et al.** (hereinafter "Fastow").

Applicants have asserted that **Yoo** fails to teach or suggest the limitation of claim 1, 9 and 40 that “the gate insulating film is interposed between the substrate and the gate electrode to have a substantially uniform thickness at the region under the gate electrode.” The Examiner has relied solely on the teachings of **Yoo** for this limitation of the claims.

In response to applicants’ arguments in the Response of February 21, 2006, that the gate insulating film for the semiconductor device of **Yoo** is not substantially uniform, the Examiner points to two disclosures of the reference. The first is a statement that the device does not create a bird’s beak structure in **Yoo**. The second is a reference to Fig. 10(b) which illustrated an intermediate formation step of the **Yoo** device. The Examiner maintains that the gate insulating film of **Yoo** at this stage of formation is substantially uniform.

In regard to the Examiner’s first citation, the fact that **Yoo** does not have a birds’ beak formation for the peripheral circuit region does not mean that the gate oxide film of the device is substantially uniform. Column 4, lines 39-43 of **Yoo** states: “The peripheral circuit transistors include...a bird’s beak-free peripheral circuit gate oxide film on the integrated circuit substrate between the spaced apart peripheral circuit source and drain regions.” However, Figs. 11-13 of **Yoo** clearly illustrate in the method of manufacturing the non-volatile memory device, that thermal oxidation is performed simultaneously on both structures in the cell array and the peripheral circuit region ((a) and (b) of Fig. 11) after the floating gate 504A and the peripheral circuit gate 508B are formed. Since thermal oxidation is performed, an increased thickness in the oxide layer is formed under the peripheral circuit gate 508B of the peripheral circuit transistor

(“the lower portion of the edge of the peripheral circuit gate 508B of the peripheral circuit region is thermally oxidized and rounded as shown in the circuit marked with the “R2” through the above-mentioned thermal processing.”(9:11-14)). Therefore, according to the manufacturing method taught by **Yoo**, the gate oxide film 503A formed under the peripheral circuit gate 508B is non-uniform and has a thicker part at each end adjacent to the oxide film 515 as shown in (b) of Fig. 13. The non-uniform thickness remains under the peripheral circuit gate 508B in the structure of **Yoo**.

This non-uniform thickness of the gate oxide film 503A is not a “substantially uniform” thickness as required by claims 1, 9 and 40. As pointed out in the response, the gate oxide film of **Yoo** when fully formed has rounded edges R2 which are clearly illustrated as increasing the oxide thickness at the corner region of the gate insulating film. This increase in thickness is related to the formation of the additional oxide film 515 after gate formation. See Col. 8, line 52 to Col. 9, line 14. Hence, applicants respectfully submit that it is clear error to maintain that **Yoo** teaches or suggests a substantially uniform gate insulating film because **Yoo** requires additional thermal oxidation which increases the peripheral area in comparison to the center area of the gate insulating film.

In regard to the Examiner’s citation to Fig. 10(b), although an Examiner may rely on an incomplete device, all the limitations of the claim must be present at the intermediate step. As illustrated in Fig. 10(a) the memory area does not disclose the bird beak structure required by the claims. Hence, the Examiner cannot rely on the intermediate device of Figure 10 because not all

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the limitations of the claim are present. Contrary, in the completed device of **Yoo**, the rounded corners of the oxide insulting film 503A are present.

In view of the above remarks, Applicants submit that the rejection is improper. Accordingly, it is respectfully requested that the rejection of the claims be withdrawn and the application be passed on to allowance.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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